

UDP/IP Integration Software Testbench Instructions

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Dependencies

- GCC
- make
- cmp (for the check make target)
- Python 2 (optional, required for test generators)
- Scapy for Python 2 (optional, required for test generators)
- udp-executable-spec.zip

Procedure

1. Unzip udp-executable-spec.zip.
2. Invoke make in the extracted folder to build the executable spec.
3. Invoke make check to run the executable spec with stored tests, the following is the expected output:

```
rx-odd pass
rx-odd2 pass
rx-even pass
rx-zero-len pass
tx-odd pass
tx-odd2 pass
tx-even pass
tx-zero-len pass
```

Example Usage

The udp program's usage message is the following:

Usage:

```
./udp <rx|tx> [--verbose|-v]
```

Input is read from stdin, output is sent to stdout. In verbose mode, extra information about the transaction is printed to stderr

- An example invocation emulating the UDP receiver:

```
$ ./udp rx < tests/rx-even.bin | hexdump
00000000 007f 0100 61ea 60ea 6968
0000000a
```

- An example invocation emulating the UDP transmitter:

```
$ ./udp tx < tests/tx-even.bin | hexdump
00000000 007f 0100 0201 0403 ea11 ea61 0060 3f0a
00000010 68a7 0069
00000013
```

Test Data Generators

These test generators create the binary input files which the udp program takes as input.

udp_rx_in_gen.py

```
$ python2 udp_rx_in_gen.py --help
usage: udp_rx_in_gen.py [-h] [--data DATA] [-o FNAME_OUTPUT] [-i FNAME_INPUT]
                        src dst sport dport
```

Create input-data files for UDP RX

positional arguments:

src	IPv4 source address, e.g., 127.0.0.1
dst	IPv4 destination address, e.g., 127.0.0.1
sport	UDP source port
dport	UDP destination port

optional arguments:

-h, --help	show this help message and exit
--data DATA	Data for the UDP payload (string)
-o FNAME_OUTPUT	Output file
-i FNAME_INPUT	Data input for the UDP payload, overrides --data

udp_tx_in_gen.py

```
$ python2 udp_tx_in_gen.py --help
usage: udp_tx_in_gen.py [-h] [-o FNAME] src dst sport dport data
```

Create input-data files for UDP TX

positional arguments:

src	IPv4 source address, e.g., 127.0.0.1
dst	IPv4 destination address, e.g., 127.0.0.1
sport	UDP source port
dport	UDP destination port
data	Data for the UDP payload (string)

optional arguments:

-h, --help	show this help message and exit
-o FNAME	Output file

A External Software Links

- [Cygwin](#) (can provide tools like GCC, make, and cmp)
- [Python](#)
- [Scapy](#)